INTEGRATED PASSIVE DEVICES FORMED BY DEMASCENE PROCESSING

ABSTRACT

A passive transmission line element (device) monolithically integrated into an integrated circuit at one or more levels of the integrated circuit by using a damascene process to delineate a conductive line such that at least the bottom surface and sidewalls of the conductive line are embedded in an enhancement layer having high permeability and/or high permitivity. Optionally a second enhancement layer may cover the conductive line, to completely embed or surround the conductive line with permeability and/or permitivity enhancement material. The passive transmission line device comprising the conductive line and the enhancement layer thus has enhanced distributed inductance and/or enhanced distributed capacitance. In addition, the passive transmission line device may optionally have enhanced distributed resistance as well by forming the conductive line from resistive (i.e., not highly conductive) material.